

FOR IMMEDIATE RELEASE

University of Memphis Pilot Study Finds Higher Microplastic Exposure from Polyester Apparel Compared to Cotton

Research conducted by the University of Memphis explores the potential relationship between clothing materials and airborne microplastic concentrations in the personal breathing zone.

Memphis, TN, October 29, 2026 – Preliminary findings from a pilot study conducted at the [University of Memphis](#), suggest that clothing fabric type may be associated with differences in airborne microplastic concentrations in the personal breathing zone.

The study was conducted by University of Memphis researchers using established scientific protocols for sample collection and analysis. While the research received funding support from the [National Cotton Council's \(NCC\) Cotton Foundation](#), the study design, data collection, analysis, and interpretation were conducted independently by the research team.

Key Findings:

- **Fabric Type and Airborne Microplastics:** Preliminary measurements suggest wearing a polyester t-shirt increased microplastic exposure by up to 42% over a cotton t-shirt.
- **Polyester Shedding & Inhalation Rate:** The study evaluated airborne microplastic concentrations near participants' breathing zones while they wore cotton or polyester-containing T-shirts. Preliminary observations showed nearly 2,000 microplastic particles per cubic meter when wearing a polyester t-shirt, highlighting a potential relationship between fabric type and personal exposure to airborne microplastics.
- **Particle Size and Potential Inhalation Exposure:** Preliminary findings suggested up to 77% of detected microplastic particles were microscopic, raising important questions about how everyday clothing choices may influence the microscopic particles present in the air we breathe.
- **PET Dominance:** The study identified polyethylene terephthalate (PET), a polymer commonly used in polyester clothing, among 99% of the airborne microplastics detected. These observations highlight the importance of investigating clothing materials as potential contributors to airborne microplastic exposure.
- **Study Limitations and Future Research:** These findings are preliminary. As with any environmental study, sampling variability, measurement uncertainties, and other potential sources of airborne microplastics may influence the results. Further research involving larger participant groups, different clothing materials, and repeated measurements is needed to confirm these observations and better understand their broader implications.

Inside the Research

The University of Memphis pilot study involved 10 participants during active daytime hours wearing 100% cotton T-shirts and polyester-containing T-shirts, alongside 12-hour baseline air measurements in participants' bedrooms. Using micro-Fourier transform infrared spectroscopy

(micro-FTIR), researchers characterized detectable airborne microplastic particles based on their size and chemical composition, including polymer identification.

"Our findings suggest that synthetic garments are a contributing source of microplastic particles within an individual's immediate breathing zone," said Chunrong Jia, Professor of Environmental Health at the University of Memphis. "While airborne microplastics exist in general indoor environments, fabric choice can affect how many microplastic particles a person is exposed to."

The research contributes to ongoing scientific efforts to better understand potential sources of airborne microplastics and the role that clothing materials may play in personal exposure. Further investigation is needed before drawing broader conclusions or making recommendations regarding specific fabric types.

"As concerns grow about the potential impact of microplastics on human health, many people are looking for practical ways to reduce their exposure, as researchers continue working to better understand the long-term impacts," said Marjory Walker, Vice President of Operations at National Cotton Council and Campaign Director for Plant Not Plastic, "These findings add to the growing body of research around microplastics and help consumers better understand how clothing and fabric choice may influence personal exposure."

"Our preliminary findings highlight the need for further research before drawing definitive conclusions. Scientists must continue improving measurement methods and reducing uncertainties. Since the long-term health and environmental impacts of microplastics are not yet fully understood, raising awareness among younger generations is especially important. They will inherit these environmental challenges, and their voices can help shape future research priorities, evidence-based regulations, and sustainable industry practices," said Dr. Farhad Jazaei, Associate Professor at the University of Memphis.

To support public education and understanding of the issue, the NCC has released a downloadable fact sheet, a detailed research summary, and consumer guidance tools on the official campaign portal. The preliminary findings can be found at [HERE](#).

"This research, which involves public health, engineering, and agriculture, highlights the kind of interdisciplinary collaboration that ACRE was created to support," said Dr. Jennifer Mandel, ACRE director. "As emerging issues, like microplastics, continue to cross traditional disciplinary boundaries, ACRE's faculty and student researchers are ready to lead innovative scientific research that advances our understanding of these complex environmental questions."

Visit www.plantnotplastic.org to download the research assets, learn more about how #WhatYouWearMatters, and join the movement toward natural fibers. Follow the campaign on social media at @PlantNotPlastic (LinkedIn, X, Facebook, Instagram, TikTok).

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National Cotton Council of America: As the U.S. cotton industry's unifying force, the Memphis, Tenn.-based National Cotton Council carries out a mission of ensuring the seven industry segments' ability to compete effectively and profitably in the raw cotton, oilseed and U.S.-manufactured product markets at home and abroad.

University of Memphis: The University of Memphis (UofM) is a comprehensive, internationally recognized, urban public research university preparing students for success in a diverse, innovative and global environment. Student success, service, innovation, knowledge discovery and dissemination, commitment to an inclusive academy, collaboration and accountability are core values at the University of Memphis.

The University is classified as “Carnegie R1” or "Doctoral: Very High Research Activity and Community Engaged" per the Carnegie Classification of Institutions of Higher Learning. With a focus on research and service benefitting communities locally and across the globe, the UofM is home to nationally designated centers of excellence in cybersecurity research and education, transportation workforce development, mobile health data and five Tennessee centers of research excellence.

Does What You Wear Affect the Air You Breathe?

A pilot study finds airborne microplastic levels rise when people wear polyester instead of cotton — with personal exposure exceeding typical indoor background levels.

Pilot Study

The takeaway: Researchers at the University of Memphis measured airborne microplastic particles in the breathing zone of participants as they went about daytime activities wearing either a cotton or a polyester T-shirt, and compared results to overnight bedroom air. The clothing someone wore was directly linked to how many microplastic particles they were exposed to, with polyester T-shirts associated with the highest personal exposure levels measured in the study.

42%

Higher airborne microplastic exposure wearing polyester vs. cotton

15

Microplastic particles inhaled per minute on average

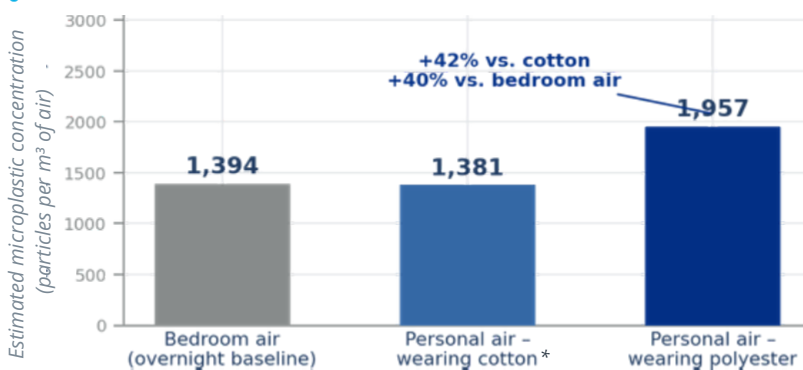
67–77%

Of particles detected were smaller than 300µm, small enough to be inhaled deeply

>99%

Of identified particles were PET, the polymer used to make polyester

WHAT THE DATA SHOWS



*Microplastics detected in cotton samples are the result of environmental exposure and textile production processes, rather than the natural cotton fiber itself.

METHODOLOGY

- **10 participants** completed paired 12-hour personal air sampling (once in a 100% cotton T-shirt, once in a polyester T-shirt) during active daytime hours.
- A parallel **12-hour bedroom air sample** was collected overnight for each participant as an indoor baseline.
- Personal samplers were worn on the chest/arm using an Ultrasonic Personal Air Sampler (UPAS v2.1).
- Filters were analyzed with **micro-Fourier-transform infrared spectroscopy (µ-FTIR)** to count particles and identify polymer type and size.
- Field blanks and duplicate samples were included throughout for quality control.

WHY IT MATTERS

This pilot study adds new evidence to the discussion around airborne microplastic exposure by examining the role of clothing materials. Because personal exposure while wearing polyester exceeded that while wearing cotton apparel, the findings suggest that fabric composition may be a relevant factor influencing everyday exposure to airborne microplastic particles.

This is an early-stage pilot study intended to inform future research. Findings are indicative of a potential exposure pathway and should be interpreted with appropriate caution pending larger, peer-reviewed studies.

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Source: "Microplastic Particles in Personal and Indoor Air," University of Memphis (2026)